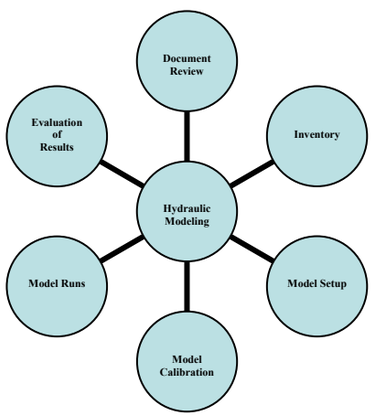
CAPACITY SOLUTIONS

Increasing system hydraulic capacity is one of several solution sets for resolving system SSOs. This can be accomplished by increasing the conveyance capacity or by storing peak flows until the existing system can safely convey the wet-weather volume stored. Determination of the timing, sizing and method for capacity enhancement is a major consideration in effectively addressing existing and potential future SSOs due to hydraulic overloads. The need for capacity solutions is identified by executing a series of master planning tasks.



Capacity solutions presented in the *Guidance Manual* are provided under three major categories:

- Capacity Assurance,
- Master Planning, and
- Capacity Enhancement

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MORE INFORMATION

The full report is available online at:
http://www.asce.org/pdf/ssosolutions.pdf

The USEPA Office of Wastewater Management has compiled extensive information regarding SSOs, including fact sheets, responses to frequently asked questions, guidance, and case studies on communities that are benefiting from their infrastructure investment.

United States Environmental Protection Agency
Office of Wastewater Management
Mail Code 4203 (SSO)
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

(04/04)

SOLUTIONS FOR SANITARY SEWER OVERFLOWS (SSOs)

Guidance Manual

ASCE

American Society of Civil Engineers

OVERVIEW

Sanitary sewer collection systems play a critical role in protecting human health and the environment. Sanitary sewer overflows (SSOs), which are releases of raw sewage, can result when these systems fail, posing health and environmental risks.

The poor performance of many sanitary sewer systems and resulting potential health and environmental risks highlights the need to improve the management, operation, and maintenance of these systems to reduce SSO occurrences.

The American Society of Civil Engineers (ASCE), under a Cooperative Agreement with the Environmental Protection Agency (EPA), contracted with Black & Veatch Corporation to develop a "*Guidance Manual of Solutions for Sanitary Sewer Overflows*". A Technical Advisory Committee (TAC) was established to provide input and review the work products of the project.

More than one hundred solutions for SSOs are presented in the Guidance Manual. Solutions are provided for both wet and dry weather SSOs. The solutions have been organized into three major categories:

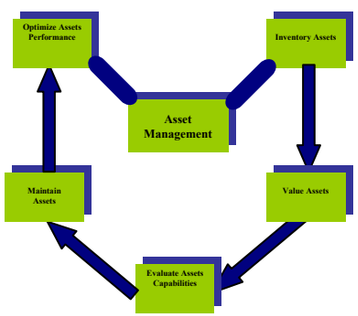
- Capacity Enhancement
- Utilization of Effective Management Tools,
- Proactive Operation and Maintenance
- Condition Assessment
- Rehabilitation

The *Guidance Manual* is available from ASCE.

MANAGEMENT SOLUTIONS

Collection system management requires good record keeping, planning, and the appropriate tools to measure desired performance and comply with regulatory requirements. These elements enable managers to develop a trained and competent workforce, capable of operating a collection system efficiently with the appropriate amount of reinvestment to minimize the occurrences of SSOs.

Management solutions presented in the *Guidance Manual* include asset management, resource management, environmental management systems, organizational management, and information management. Solutions are also included to address fats, oils and grease (FOG), private property I/I, and control of satellite flows. Monitoring & reporting, and overflow response plans are also presented. Guidelines are also provided to establish performance standards, perform self-assessment, and develop effective training programs.



O&M SOLUTIONS

Operation & Maintenance (O&M) strategies to address the immediate pipe problems and enhance the long term performance of the collection system are critical for an agency to influence the SSO trend. A successful O&M plan depends on utilizing the right mix of the following O&M strategies:

- Emergency/Reactive Maintenance,
- Corrective Maintenance, and
- Proactive Maintenance

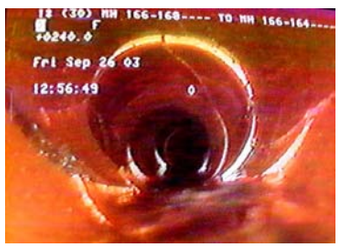
O&M solutions presented in the *Guidance Manual* include a variety of maintenance tools and techniques for cleaning of sewer lines and removing of debris.

Techniques for cutting and removing roots, their chemical treatment and other containment and control mechanisms are discussed. Grease removal and bioremediation of grease in the pipe are also addressed. O&M solutions for pumping stations and treatment plants are also provided in the *Guidance Manual*.

CONDITION ASSESSMENT SOLUTIONS

Condition assessment techniques are utilized to develop an understanding of the nature and causes of SSOs. By defining the existing sewer conditions that lead to overflows and backups, the necessary resources to preclude future occurrences can be deployed.

The condition assessment solutions presented in the *Guidance Manual* include Closed Circuit Television Inspection (CCTV), Sewer Scanner & Evaluation Technology (SSET), and sonar technology. Flow & rainfall monitoring, flow isolation tests, smoke testing, and dyed water testing are also presented. Other solutions presented include manhole, pumping station, and force main inspections.



Condition assessment may address the structural and/or infiltration/inflow conditions. For structural assessment, particular attention is made to defects such as pipe breaks, cracks, displaced joints, missing pipe pieces, and sags. I/I condition assessment is performed by utilizing a combination of methods such as manhole inspection, CCTV inspection of sewer lines, and flow monitoring.

REHABILITATION SOLUTIONS

The need for collection system rehabilitation arises from several factors:

- structural Integrity Deterioration,
- Additional Hydraulic Capacity Needs
- Excessive Infiltration/Inflow, and
- SSOs' Regulatory Control

Generally, both short term and long term rehabilitation plans are developed for system renewal. Short-term plans include repair of critical defects needing immediate repair. Long-term plans include projected needs and less immediate needs.

Rehabilitation solutions provided in the *Guidance Manual* cover rehabilitation of sewer lines, manholes, and laterals. Trenchless techniques, such as sliplining, fold & form, cured-in-place-pipe (CIPP), spirally wound pipe, segmental lining, and on-line replacement, as well as open cut techniques are presented. Spot repair solutions include chemical grouting and rubber seals. Manhole rehabilitation solutions include chemical grouting, coating systems, structural linings, and frame, cover, and chimney repair and/or replacement.